GENERAL INDEX

(*a*) indicates an abstract.

Indexes of Authors' Names and Participants in Discussions are given separately, as are numbered lists of Institution *Communications* and of Gas Council (*GC* Series) *Research Communications*.

About Patents . . . 664
Abrasive Wheels Regulations . . . 304
Accounting for Conversion: A.M. Sykes (*a*) . . . 525
Analytical Methods for Effluents . . . 158, 856
108th Annual General Meeting . . . 497
The Application of Work Study to Customer Service:
L. Ward (*Comm.* 846) . . . 835
Presentation, Discussion and Reply . . . 845
Association Technique de l'Industrie du Gaz en France . . . 662
Authors' Biographical Notes 60, 139, 228, 292, 374, 431, 511, 585, 663, 718, 796, 852
36th Autumn Research Meeting . . . 61

B.C.U.R.A. to Close . . . 159
Bigger L.P.G. Ships . . . 227
The Blow-off of Burner Flames:
H. Edmondson and M. P. Heap. (*Comm.* 808) . . . 305
Presentation, Discussion and Reply . . . 314
The British Association for the Advancement of Science . . . 68
British Cryogenics Council Prize . . . 151
Building Research Station "Open Days" . . . 293

3rd Carbonisation Science Lecture . . . 718
Chairmen's Technical Committee: 1969-70, 31st Report of the. (*Comm.* 832) . . . 3
Presentation and Discussion . . . 20
Computers, Communications and Customers:
K. E. Jones and W. V. Olsson. (*Comm.* 843) . . . 807
Presentation, Discussion and Reply . . . 831
Construction Equipment Engineering . . . 729
Continental Shelf . . . 368
Control System for the Gas Council's Transmission Network:
J. B. C. Bower, H. S. Jones, J. W. Smith and C. H. Townsend. (*Comm.* 850) . . . 773
Presentation, Discussion and Reply . . . 786
Conversion—A Quarter of the Way: G. B. Carter (*a*) . . . 521
Conversion: The Rôle of the Commercial Surveyor:
B. Hindmarch (*a*) . . . 382
Conversion Task Force: G. A. Dexter (*a*) . . . 298
C.O.R.G.I. First Registers Available . . . 149
Corrosion and Protection . . . 145
Costing Heat Exchangers . . . 515
Council of Engineering Institutions:
1970 MacRobert Award Goes to BP Geologists . . . 78
Recognition in New Zealand of C.E.I. Qualification . . . 79
The MacRobert Award . . . 156
Industrial Relations and the Chartered Engineer . . . 229
New "1851" Senior Industrial Fellows . . . 229, 861
Staff Appointment . . . 229
The MacRobert Award (1971): Later Submissions Date . . . 295
Engineers Registration Board: Privy Council Approval . . . 295
And Management Studies . . . 295
Engineers Registration Board Composite Register . . . 372
Sir Henry Jones 1970 Graham Clark Lecture Booklet . . . 372
Paul Instrument Fund . . . 372
Fifth International Congress of Engineers . . . 372, 575
Creativity in Design . . . 372
1971 Survey of Professional Engineers . . . 434
W. F. E. O. Committee on Engineering Information . . . 434
Luncheon Club Membership . . . 434
Industrial Relations Bill . . . 575
Consulting Engineers Win Queens Award . . . 575
Conference on Hazards in Construction . . . 665
Fifth International Congress of Engineers . . . 665
17th Graham Clark Lecture . . . 665
Commonwealth Engineering Conference . . . 665
Engineers Registration Board: Technician Engineers . . . 665
Southern Committee's Chartered Engineers Lecture . . . 729
New Vice-Chairman . . . 861

Customers:
See: Computers, Communications and Customers.: K. E. Jones and W. V. Olsson. (*Comm.* 843). . . . 807
See: The Application of Work Study to Customer Service: L. Ward. (*Comm.* 846) . . . 835
See: Customer First: W. M. Johnston (*a*) . . . 857
See: Service and the Customer: A. G. Hathaway (*a*) . . . 858

The Development and Exploitation of Rapid Heating Techniques: J. Masters, B. Oeppen, C. J. Towler, and P. F. Y. Wong. (*Comm.* 849). . . . 695
Presentation, Discussion and Reply . . . 712
The Development of Computer Services in the Northern Gas Board: J. H. Holmes (*a*) . . . 383
Development of the Natural-gas Supply System: W. J. Walters. (*Comm.* 852) . . . 548
The Development of Technology by the Gas Industry: A. J. Spackman. (*a*) . . . 298
Dilution of Saharan Natural Gas: M. R. Creed. (*a*) . . . 524
Distributed, But Not Sold: A. D. Mason. (*a*) . . . 377
Distribution in the "Seventies": A. D. Lane. (*a*) . . . 380
Distribution in the United States, New Developments in: M. W. Anuskiewicz. (*Comm.* 848) . . . 637
Presentation, Distribution and Reply . . . 650
Distribution, Modern Development of Plastics Systems for Gas: A. Walker and G. Clerehugh. (*Comm.* 825) . . . 102
Presentation, Discussion and Reply . . . 128
District Sections and Affiliated Associations 69, 141, 230, 296, 376, 435, 520, 577, 666, 727, 803, 857

Education and Training Committee, 1969-70. 1st Report of: (*Comm.* 833) . . . 83
Presentation, Discussion and Reply . . . 97
The Effects on Plastic Pipes of Gas-conditioning Agents and Other Additives: J. T. O'Shea, R. O'Sullivan, A. V. Smith and L. J. Wood. (*GC*173) . . . 117
Presentation, Discussion and Reply . . . 128
Engineering Aspects of a High-pressure Transmission System. (*a*) . . . 147
Engineering for Natural Gas . . . 370
Engineering in Ireland: A. L. Allen. (*a*) . . . 441
Engineering Problems on High-pressure Gas Plants: G. M. Rimmer. (*Comm.* 836) . . . 163
Presentation, Discussion and Reply . . . 182
Essential Link with Universities . . . 219
Existing and Potential Use of Natural Gas in the Glass Container Industry: S. A. Cole. (*a*) . . . 728

Field Experience of Mechanically Assisted and Fan-diluted Flues: A. Stirk. (*a*) . . . 144
First Lloyd's Register Class Construction in the United States . . . 661
The First Year's Operation of the Council's Terminal, Bacton: G. O. Walker. (*a*) . . . 438
Flash-tube Ignition of the Cooker Hotplate: A. J. Miles (*GC* 172) . . . 339
Presentation, Discussion and Reply . . . 357
Forthcoming Meetings 74, 153, 236, 302, 373, 446, 510, 680, 726, 801, 859

Gas and the Improvement of Existing Rented Dwellings: J. Monaghan. (*a*) . . . 441
Gas-conditioning Agents and Other Additives, The Effects on Plastic Pipe of: J. T. O'Shea, R. O'Sullivan, A. V. Smith and L. G. Wood. (*GC* 173) . . . 117
Presentation Discussion and Reply . . . 128
Gas Council 72, 148, 293, 367, 443, 514, 581, 658, 722, 793, 860

GENERAL INDEX

(*a*) indicates an abstract.

Indexes of Authors' Names and Participants in Discussions are given separately, as are numbered lists of Institution *Communications* and of Gas Council (*GC* Series) *Research Communications*.

About Patents . . . 664
Abrasive Wheels Regulations . . . 304
Accounting for Conversion: A.M. Sykes (*a*) . . . 525
Analytical Methods for Effluents . . . 158, 856
108th Annual General Meeting . . . 497
The Application of Work Study to Customer Service:
L. Ward (*Comm.* 846) . . . 835
Presentation, Discussion and Reply . . . 845
Association Technique de l'Industrie du Gaz en France . . . 662
Authors' Biographical Notes 60, 139, 228, 292, 374, 431, 511, 585, 663, 718, 796, 852
36th Autumn Research Meeting . . . 61

B.C.U.R.A. to Close . . . 159
Bigger L.P.G. Ships . . . 227
The Blow-off of Burner Flames:
H. Edmondson and M. P. Heap. (*Comm.* 808) . . . 305
Presentation, Discussion and Reply . . . 314
The British Association for the Advancement of Science . . . 68
British Cryogenics Council Prize . . . 151
Building Research Station "Open Days" . . . 293

3rd Carbonisation Science Lecture . . . 718
Chairmen's Technical Committee: 1969-70, 31st Report of the. (*Comm.* 832) . . . 3
Presentation and Discussion . . . 20
Computers, Communications and Customers:
K. E. Jones and W. V. Olsson. (*Comm.* 843) . . . 807
Presentation, Discussion and Reply . . . 831
Construction Equipment Engineering . . . 729
Continental Shelf . . . 368
Control System for the Gas Council's Transmission Network:
J. B. C. Bower, H. S. Jones, J. W. Smith and C. H. Townsend. (*Comm.* 850) . . . 773
Presentation, Discussion and Reply . . . 786
Conversion—A Quarter of the Way: G. B. Carter (*a*) . . . 521
Conversion: The Rôle of the Commercial Surveyor:
B. Hindmarch (*a*) . . . 382
Conversion Task Force: G. A. Dexter (*a*) . . . 298
C.O.R.G.I. First Registers Available . . . 149
Corrosion and Protection . . . 145
Costing Heat Exchangers . . . 515
Council of Engineering Institutions:
1970 MacRobert Award Goes to BP Geologists . . . 78
Recognition in New Zealand of C.E.I. Qualification . . . 79
The MacRobert Award . . . 156
Industrial Relations and the Chartered Engineer . . . 229
New "1851" Senior Industrial Fellows . . . 229, 861
Staff Appointment . . . 229
The MacRobert Award (1971): Later Submissions Date . . . 295
Engineers Registration Board: Privy Council Approval . . . 295
And Management Studies . . . 295
Engineers Registration Board Composite Register . . . 372
Sir Henry Jones 1970 Graham Clark Lecture Booklet . . . 372
Paul Instrument Fund . . . 372
Fifth International Congress of Engineers . . . 372, 575
Creativity in Design . . . 372
1971 Survey of Professional Engineers . . . 434
W. F. E. O. Committee on Engineering Information . . . 434
Luncheon Club Membership . . . 434
Industrial Relations Bill . . . 575
Consulting Engineers Win Queens Award . . . 575
Conference on Hazards in Construction . . . 665
Fifth International Congress of Engineers . . . 665
17th Graham Clark Lecture . . . 665
Commonwealth Engineering Conference . . . 665
Engineers Registration Board: Technician Engineers . . . 665
Southern Committee's Chartered Engineers Lecture . . . 729
New Vice-Chairman . . . 861

Customers:
See: Computers, Communications and Customers.: K. E. Jones and W. V. Olsson. (*Comm.* 843). . . . 807
See: The Application of Work Study to Customer Service: L. Ward. (*Comm.* 846) . . . 835
See: Customer First: W. M. Johnston (*a*) . . . 857
See: Service and the Customer: A. G. Hathaway (*a*) . . . 858

The Development and Exploitation of Rapid Heating Techniques: J. Masters, B. Oeppen, C. J. Towler, and P. F. Y. Wong. (*Comm.* 849). . . . 695
Presentation, Discussion and Reply . . . 712
The Development of Computer Services in the Northern Gas Board: J. H. Holmes (*a*) . . . 383
Development of the Natural-gas Supply System: W. J. Walters. (*Comm.* 852) . . . 548
The Development of Technology by the Gas Industry: A. J. Spackman. (*a*) . . . 298
Dilution of Saharan Natural Gas: M. R. Creed. (*a*) . . . 524
Distributed, But Not Sold: A. D. Mason. (*a*) . . . 377
Distribution in the "Seventies": A. D. Lane. (*a*) . . . 380
Distribution in the United States, New Developments in: M. W. Anuskiewicz. (*Comm.* 848) . . . 637
Presentation, Distribution and Reply . . . 650
Distribution, Modern Development of Plastics Systems for Gas: A. Walker and G. Clerehugh. (*Comm.* 825) . . . 102
Presentation, Discussion and Reply . . . 128
District Sections and Affiliated Associations 69, 141, 230, 296, 376, 435, 520, 577, 666, 727, 803, 857

Education and Training Committee, 1969-70. 1st Report of: (*Comm.* 833) . . . 83
Presentation, Discussion and Reply . . . 97
The Effects on Plastic Pipes of Gas-conditioning Agents and Other Additives: J. T. O'Shea, R. O'Sullivan, A. V. Smith and L. J. Wood. (*GC*173) . . . 117
Presentation, Discussion and Reply . . . 128
Engineering Aspects of a High-pressure Transmission System. (*a*) . . . 147
Engineering for Natural Gas . . . 370
Engineering in Ireland: A. L. Allen. (*a*) . . . 441
Engineering Problems on High-pressure Gas Plants: G. M. Rimmer. (*Comm.* 836) . . . 163
Presentation, Discussion and Reply . . . 182
Essential Link with Universities . . . 219
Existing and Potential Use of Natural Gas in the Glass Container Industry: S. A. Cole. (*a*) . . . 728

Field Experience of Mechanically Assisted and Fan-diluted Flues: A. Stirk. (*a*) . . . 144
First Lloyd's Register Class Construction in the United States . . . 661
The First Year's Operation of the Council's Terminal, Bacton: G. O. Walker. (*a*) . . . 438
Flash-tube Ignition of the Cooker Hotplate: A. J. Miles (*GC* 172) . . . 339
Presentation, Discussion and Reply . . . 357
Forthcoming Meetings 74, 153, 236, 302, 373, 446, 510, 680, 726, 801, 859

Gas and the Improvement of Existing Rented Dwellings: J. Monaghan. (*a*) . . . 441
Gas-conditioning Agents and Other Additives, The Effects on Plastic Pipe of: J. T. O'Shea, R. O'Sullivan, A. V. Smith and L. G. Wood. (*GC* 173) . . . 117
Presentation Discussion and Reply . . . 128
Gas Council 72, 148, 293, 367, 443, 514, 581, 658, 722, 793, 860

Gas Council's Transmission Network, Control System for: J. B. C. Bower, H. S. Jones, J. W. Smith, and C. H. Townsend. (*Comm.* 850) 773
Presentation, Discussion and Reply 786
Gas Firing of Shell Boilers: C. H. Rann, M. Kinder, C. C. Drewery and Miss E. M. Hall. (*a*) 70
Gas for Air Conditioning: D. W. Bryant. (*a*) 525
Gas Industry Training Board:
Annual Report 667
Reconstitution of 526
Gas Measurement Seminar and Exhibition. 152
Gas Storage: P. Hood. (*a*) 382
General Notices 80, 159, 238, 304, 384, 446, 526, 587, 668, 729, 804, 861
Glass-container Industry: Existing and Potential Uses of Natural Gas in the: S.A. Cole. (*a*) 728

High-pressure Gas Plants, Engineering Problems on: G. M. Rimmer. (*Comm.* 836) 163
Presentation, Discussion and Reply 182
High-pressure Gas Transmission System, Some Aspects of the Maintenance of: R. N. Knott. (*Comm.* 853) . . 606
Holder Station Conversion and Control: B. Leitch. (*a*) . 299
Housing Development—Modernisation: M. H. Padgett. (*a*). 442
Humidification: J. W. Handrihan. (*a*) 382

Immediate-Past President (1970-71): F. Bell 449
In this Issue. *See:* Authors' Biographical Notes.
Incorporated Benevolent Fund of the Institution of Gas Engineers 8th Annual General Meeting 508
Industrial Conversion: C. R. Holt, A. Lomax and D. Woods. (*a*) 299
The Influence of I.G.E. 674A on Steel Pipelines: T. Cook. (*a*) . 440
Influence of Natural Gas on (Tree) Plantations 371
Installation and Ventilation: E. W. Berry, R. D. Bruce, and B. C. Carter. (*GC* 177) 589
Presentation, Discussion and Reply 601
Institution Register 66, 224, 291, 366, 444, 582, 794, 854
International Cryogenics Exhibition and Conference . . 150
International Gas Union:
Council Meeting, Washington—29th April, 1971 . 433, 798
12th World Gas Conference, 1973 799
Interruptible Supplies of Gas, Technology of Large Boiler Firing Using: R. A. Hancock. (*GC* 176) 462
Presentation, Discussion and Reply 472
In this Issue 60, 139, 228, 292, 374, 431, 511, 585, 663, 718, 796, 852
Is it Them or Us? E. G. Curran. (*a*) 523

Laboratory of the Government Chemist "Open Days" 667
The Lamesley Underground Gas Storage Installation: N. Peacock and E. L. Robson. (*a*) 580
Large-volume Gas Measurement: A. Griffiths and J. Newcombe. (*Comm.* 834) 23
Presentation, Discussion and Reply 40
Leakage Control: M. J. Townsend. (*a*) 522
Leakage Control in the Natural Gas Era: E. W. Pickering, C. A. Spearman and M. W. G. Tanner. (*GC* 175) . . 260
Presentation, Discussion and Reply 284
Library Accessions 73, 237, 301, 375, 445, 518, 574, 719, 803, 860
LNG—Aid to Conversion: G. W. Nicol and R. F. Berr. (*a*). 300
LNG—3 Conference 519, 586, 855
L.P.G. Reforming: S. Monro. (*a*) 382
Luncheons Speeches:
At 36th Autumn Research, 1970 63
At President's, 1971 504

MacRobert Award Lecture 797
Maintenance of a Medium-pressure Distribution System with Steel Mains: M. E. Oliver. (*a*) 440
Management Development: For Whom and By Whom?: J. S. Eadie. (*a*) 69
Manchester and District Section 666
Materials Handling Problems 721
Mathematical Analysis for Gas Industry Application, Recent Advances in: A. Brameller, V. E. Chancellor, Y. Hamam, and C. Yalcindag. (*Comm.* 837) 188
Presentation, Discussion and Reply 215

Metrication Board, New Deputy Chairman for 851
Modern Combustion Practice 301
Modern Developments of Plastics Systems for Gas Distribution: A. Walker and G. Clerehugh. (*Comm.* 835) . 102
Presentation, Discussion and Reply 128
Multi-stage Jet Boosters: H. B. Bassett and J. J. Templeman (*GC* 170) 239
Presentation, Discussion and Reply 253

Natural Gas as a "Raw Material" 719
Natural Gas in Large-volume and Industrial Markets (As Experienced by an Ontario Utility): E. G. Moogk (*Comm.* 847) 671
Presentation, Discussion and Reply 689
New Building Method for L.N.G. Ships 443
New Developments in Distribution in the United States: M. W. Anuskiewicz. (*Comm.* 848) 637
Presentation, Discussion and Reply 650
New Developments in Radiant Heating Systems: K. F. Coles and L. P. Bagge. (*Comm.* 839) 387
Presentation, Discussion and Reply 402
New Offshore Mineral Workings Act 661
New Ordinary Members of Council 512
New Year Message from the President: F. Bell 1
News from the Gas Industry Overseas 226, 294, 369, 516, 576, 662, 724, 798, 855
Noise Control: G. J. Holliss. (*a*) 141
Nomination of Ordinary Members of Council . 68, 147, 221
Non-aerated Burners for Natural Gas: B. C. Dutton: J. A. Harris and B. J. Kavarana. (*GC*179) 476
Presentation, Discussion and Reply 491
North Sea Gas "Eternal Flame" 159
The Odorisation of Natural Gas: A. B. Densham, P. A. Gibbons, M. D. Glidewell, R. Palmer, and G. F. I. Roberts (*GC*178) 529
Presentation, Discussion and Reply 543

Officers and Council of the Institution of Gas Engineers:
1970-71 2
1971-72 448
Officers of District Sections and Affiliated Associations 162, 386, 588, 670, 732, 806
Open University:
Technology Faculty First Course 511
Occasional Students 586
Operational Research: J. E. McKerchar. (*a*) 300
Overseas Papers, Abstracts of: *See* News from the Gas Industry Overseas.

Past-Presidents 510
Permanent Soviet/U.K. Commission 223
Personal Notes . 80, 140, 365, 445, 513, 581, 657, 725, 800,
The Philosophy of Gas Storage: D. J. Clarke, G. S. Cribb, and W. J. Walters. (*Comm.* 845) 748
Presentation, Discussion and Reply 845
Pilot Performance: R. F. Darling. (*a*) 524
Plastic Pipes of Gas-conditioning Agents and Other Additives, The Effects on: J. T. O'Shea, R. O'Sullivan, A. V. Smith, and L. J. Wood. (*GC*173) 117
Presentation, Discussion and Reply 128
Plastic Pipes Symposium 138
Plastics Systems for Gas Distribution, Modern Development of: A. Walker and G. Clerehugh. (*Comm.* 835) . . 102
Presentation, Discussion and Reply 128
Praesis ut Prosis: F. Craven and W. P. Whittaker. (*a*) . . 577
President at Buckingham Palace: Mr. F. Bell Receives the O.B.E. 221
President (1971-72): J. A. Buckley 447
Presidential Address: K. E. Maplethorpe. (*a*) 297
Proceedings of Council . . 59, 220, 290, 364, 432, 496, 572, 791, 850
Public Works and Municipal Services Congress: Summaries of Institution-sponsored Papers 146
Publications Policy:
Important Notice to All Members 852
Arrangements for Binding *Journal* (Unchanged) . . 853

Rapid Heating Techniques, The Development and Exploitation of: J. Masters, B. Oeppen, C. J. Towler, and P. F. Y. Wong. (*Comm.* 849) 695
Presentation, Discussion and Reply 712
Radiant Heating Systems, New Developments in: K. F. Coles, and L. P. Bagge. (*Comm.* 839) 387
Presentation, Discussion and Reply 402
Recent Advances in Mathematical Analysis for Gas Industry Applications: A. Brameller, V. E. Chancellor, Y. Hamam and C. Yalcindag. (*Comm.* 837) 188
Presentation, Discussion and Reply 215
Refractories Committee: 1969-70, 61st Report of the Joint. (*GC*174) 405
Presentation, Discussion and Reply 426
31st Report of the Chairmen's Technical Committee: 1969-70 (*Comm.* 832) 3
Presentation and Discussion 20
1st Report of the Education and Training Committee: 1969-70 (*Comm.* 833) 83
Presentation, Discussion and Reply 97
61st Report of the Joint Refractories Committee: 1969-70. (*GC*174) 405
Presentation, Discussion and Reply 426
Report of Stability in Modern Buildings 797
Report on the Gas Council Research Scholarships: 1970 (*GC*169) 49
Presentation 58
Resumption of Smoke Control 664
A Review of Training Provided by "Norgas" Training College: C. B. Fotherby, J. C. Mowatt, V. R. Burrows, H. Wiles, and T. Harland. (*a*) 579

Second Seminar on Gas Measurement 720
Societé Suisse de l'Industrie du Gaz et des Eaux . . 724
S.B.G.I. Silver Medal Awards, 1971 519
Second Seminar on Communication 674A 518
SEGAS Central Laboratories: Dr. J. R. Dewhurst. (*a*) . 379
Seminar on Communication 674A 290
Service and the Customer: A. G. Hathaway (*a*) . . . 858
Some Aspects of the Maintenance of a High-pressure Gas Transmission System: R. N. Knott. (*Comm.* 853) 143 (*a*), 606
Spark Ignition of Natural Gas: Theory and Practice: J. F. Sayers, G. P. Tewari, J. R. Wilson, and P. F. Jessen. (*GC*171) 322
Presentation, Discussion and Reply 357
Steam Boiler Changeover: P. C. Elkins. (*a*) 230
Systems and Control Engineering: B. T. Pottle. (*a*) . . 298

Technology of Large-boiler Firing, Using Interruptible Supplies of Gas: R. A. Hancock. (*GC*176) 462
Presentation, Discussion and Reply 472
Telecommunications: W. V. Olsson and R. F. J. King. (*a*) . 234
Test Gases for Today: R. E. Clifford. (*a*) 377
Thoughts on the Future Uses of Continuous Reformers Now Employed in the Gas Industry: G. Milner. (*a*). . 232
Total Energy in the Gas Industry: J. Pearson and P. B. Simpson. (*Comm.* 844) 733
Presentation, Discussion and Reply 742
Transmission Network, Control System for the Gas Council's: J. B. C. Bower, H. S. Jones, J. W. Smith, and C. H. Townsend. (*Comm.* 850) 773
Presentation, Discussion and Reply 786

United States, New Developments in Distribution in the: M. W. Anuskiewicz. (*Comm.* 848) 637
Presentation, Discussion and Reply 650
The Use of Autothermic Air in the Reforming of Natural Gas: P. O'Brien. (*a*) 382

Vice-President (1971-73) T. W. Jackson 449

Washwood Heath Works: M. J. Rushton. (*a*) 440
What Gas Council Approval Really Means: C. P. Henshilwood. (*a*) 437
Work and Function of the Research and Development Division: K. L. Stretch. (*a*) 436
Work Study to Customer Service, The Application of: L. Ward. (*Comm.* 846) 835

INDEX OF AUTHORS

(*a*) indicates an abstract.

An Index of Participants in Discussions is given separately.

Allen, A. L. Engineering in Ireland. (*a*) 441
Anuskiewicz, M. New Developments in Distribution in the United States. (*Comm.* 848) 637

Bagge, L. P. *See* K. F. Coles and L. P. Bagge
Bassett, H. B., and Templeman, J. J. Multi-stage Jet Boosters (*GC*170) 239
Bell, F. New Year Message from the President . . . 1
Bell, F. Presidential Address. (*Comm.* 842). 450
Berry, E. W., Bruce, R. D., and Carter, B. C. Installation and Ventilation. (*GC*177) 589
Blyth, J. (*a*) 70
Bouch, W. E. Presidential Address. (*a*) 580
Bower, J. B. C., Jones, H. S., Smith, J. W., and Townsend, C. H. Control System for the Gas Council's Transmission Network. (*Comm.* 850) 773
Brameller, A., Chancellor, V. E., Hamam, Y., and Yalcindag, C. Recent Advances in Mathematical Analysis for Gas Industry Applicatcn. (*Comm.* 837) 199
Bruce, R. D. *See* Berry, E. W., Bruce, R. D., and Carter, B. C.
Bryant, D. W. Gas for Air Conditioning. (*a*) 525
Burrows, V. R. *See* Fotherby C. B., Mowatt, J. C., Burrows, V. R., Wiles, H., and Harland, T.

Carter, B. C., *See:* Berry, E. W., Bruce, R. D., and Carter, B.C.
Carter, G. B. Conversion—A Quarter of the Way. (*a*). . 521
Chancellor, V. E. *See* A. Brameller, V. E. Chancellor, Y. Hamam and C. Yalcindag.
Clarke, D. J., Cribb, G. S., and Walters, W. J. The Philosophy of Gas Storage. (*Comm.* 845) 748
Clerehugh, G. *See* Walker A. and Clerehugh G.
Cole, S. A. Existing and Potential Use of Natural Gas in the Glass Container Industry. (*a*) 728
Coles, K. F., and Bagge, L. P. New Developments in Radiant Heating Systems. (*Comm.* 839) 387
Cook, T. The Influence of I.G.E. 674A on Steel Pipelines (*a*) . 440
Craven, F., and Whittaker, W. P. *Praesis ut Prosis.* (*a*) . 577
Creed, M. R. Dilution of Saharan Natural Gas. (*a*) . . 524
Cribb, G. S. *See* Clarke, D. J., Cribb, G. S., and Walters, W. J.
Curran, E. G. Is It Them or Us? (*a*) 523

Dance, E. W. G., Changeover from Other Fuels to Gas. (*a*). 146
Darling, R. F. Pilot Performance. (*a*) 524
Densham, A. B., Gibbons, P. A., Glidewell, M. D., Palmer, R., and Roberts, G. F. I. The Odorisation of Natural Gas. (*GC*178) 529
Dewhurst, J. R. SEGAS Central Laboratories. (*a*) . . 379
Dexter, G. A. Conversion Task Force. (*a*) 298
Dutton, B. C., Harris, J. A., and Kavarana, B. J. Non-aerated Burners for Natural Gas. (*GC*179) 476

Eadie, J. S. Management Development: For Whom and By Whom? (*a*) 69
Edmondson, H., and Heap, M. P. The Blow-off of Burner Flames. (*Comm.* 808) 305
Presentation, Discussion and Reply 314
Elkins, P. C. Steam Boiler Changeover. (*a*) 230

Fotherby, C. B., Mowatt, J. C., Burrows, V. R., Wiles, H., and Harland, T. A. A Review of Training Provided by "Norgas" Training College. (*a*) 579

Gibbons, P. A. *See* Densham, A. B. Gibbons, P. A., Glidewell, M. D., Palmer, R., and Roberts, G. F. I.
Glidewell, M. D. *See* Densham, A. B., Gibbons, P. A., Glidewell, M. D., Palmer, R., and Roberts, G. F. I.
Griffiths, A., and Newcombe, J. Large-volume Gas Measurement. (*Comm.* 834) 23
Presentation, Discussion and Reply 40

Hamam, Y. *See* Brameller, A., Chancellor, V. E., Hamam, Y., and Yalcindag, C.
Hancock, R. A. The Technology of Large-boiler Firing, Using Interruptible Supplies of Gas. (*GC*176) 462
Presentation, Discussion and Reply 472
Handrihan, J. W. Humidification. (*a*) 382
Harland, R. *See* Fotherby, C. B., Mowatt, J. C., Burrows, V. R., Wiles, H., and Harland, T.
Harris, J. A. *See* Dutton, B. C., Harris, J. A., and Kavarana, B. J.
Hathaway, A. G., Service and the Customer (*a*). . . . 858
Heap, M. P. *See* Edmondson, H., and Heap, M. P.
Henshilwood, C. P. What Gas Council Approval Really Means. (*a*) 437
Hindmarch, B. Conversion: The Role of the Commercial Surveyor. (*a*) 382
Holliss, G. J. Noise Control. (*a*) 141
Holmes, J. H. The Development of Computer Services in the Northern Gas Board. (*a*) 383
Holt, C. R., Lomax, A., and Woods, D. Industrial Conversion. (*a*) 299
Hood, P. Gas Storage. (*a*) 382

Jessen, P. F. *See* Sayers, J. F., Tewari, G. P., Wilson, J. R., and Jessen, P. F.
Johnston, W. M., Customer First (*a*). 857
Jones, H. S. *See* Bower, J. B. C., Jones, H. S., Smith, J. W., and Townsend, C. H.
Jones, K. E., and Olsson, W. V. Computers, Communications and Customers. (*Comm.* 843). 807

Kavarana, B. J. *See* Dutton, B. C., Harris, J. A., and Kavarana, B. J.
King, R. F. J., *See* Olsson, W. V., and King, R. F. J.
Knott, R. N. Some Aspects of the Maintenance of a High-pressure Gas Transmission System. (*Comm.* 853) 143(*a*), 606

Lane, A. D. Distribution in the "Seventies". (*a*) . . 380
Leitch, B. Holder Station Conversion and Control. (*a*) . 299

McKerchar, J. E. Operational Research. (*a*) 300
Maplethorpe, K. E. Presidential Address. (*a*) 297
Mason, A. D. Distributed, But Not Sold. (*a*) 377
Masters, J., Oeppen, B., Towler, C. J., and Wong, P. F. Y. The Development and Exploitation of Rapid Heating Techniques (*Comm.* 849) 695
Presentation, Discussion and Reply 712
Miles, A. J. Flash Tube Ignition of the Cooker Hotplate (*GC*172) 339
Presentation, Discussion and Reply 257
Milner, G. Thoughts on the Future Uses of Continuous Reformers Now Employed in the Gas Industry. (*a*) . . 232
Monaghan, J. Gas and the Improvement of Existing Rented Dwellings. (*a*) 441
Monro, S. L.P.G. Reforming. (*a*) 382
Moogk, E. G. Natural Gas in Large-volume and Industrial Markets (As Experienced by an Ontario Utility) (*Comm.* 847) 671
Presentation, Discussion and Reply 689
Mowatt, J. C. *See* Fotherby, C. B., Mowatt, J. C., Burrows, V. R., Wiles, H., and Harland, T.

Newcombe, J. *See* Griffiths, A., and Newcombe, J.
Nicol, G. W., and Berry, R. F. L.N.G.—An Aid to Conversion. (*a*) 300

O'Brien, P. The Use of Autothermic Air in the Reforming of Natural Gas. (*a*) 382
Oeppen, B. *See* Masters, J., Oeppen, B., Towler, C. J., and Wong, P. F. Y.
Oliver, M. E. Maintenance of a Medium-pressure Distribution System with Steel Mains. (*a*) 440
Olsson, W. V., and King, R. F. J. Telecommunications. (*a*) . 234
Olsson, W. V. *See* Jones, K. E., and Olsson, W. V. . . 807
O'Shea, J. T., O'Sullivan, R., Smith, A. V., and Wood, L. J. The Effects on Plastic Pipes of Gas-conditioning Agents and Other Additives. (*GC*173) 117
Presentation, Discussion and Reply 128
O'Sullivan R. *See* O'Shea, J. T., O'Sullivan, R., Smith, A. V. and Wood, L. J.

Padgett, M. H. Housing Development—Modernisation, (*a*) . 442
Palmer, R. *See* Densham, A. B., Gibbons, P. A., Glidewell, M. D., Palmer, R., and Roberts, G. F. I.
Peacock, N., and Robson, E. L. The Lamesly Underground Gas Storage Installation. (*a*) 580
Pearson, J., and Simpson, P. B. Total Energy in the Gas Industry. (*Comm.* 844) 733
Presentation, Discussion and Reply 742
Pickering, E. W., Spearman, C. A., and Tanner, M. W. G., Leakage Control in the Natural Gas Era. (*GC*175) . . 260
Presentation, Discussion and Reply 284
Pottle, B. T. Systems and Control Engineering. (*a*) . . 298

Rann, C. H., Kinder, M., Drewery, C. C., and Hall, E. M. Gas Firing of Shell Boilers. (*a*) 70
Rimmer, G. M. Engineering Problems on High-pressure Gas Plants. (*Comm.* 836) 163
Presentation, Discussion and Reply 182
Roberts, G. F. I. *See* Densham, A. B., Gibbons, P. A., Glidewell, M. D., Palmer, R., and Roberts, G. F. I.
Robson, E. L. *See* Peacock, N., and Robson, E. L.
Rushton, M. J., Washwood Heath Works. (*a*) 440

Sayers, J. F., Tewari, G. P., Wilson, J. R., and Jessen, P. F. Spark Ignition of Natural Gas: Theory and Practice (*GC*171) 322
Presentation, Discussion and Reply 357
Simpson, P. B. *See* Pearson, J., and Simpson, P. B.
Smith, A. V. *See* O'Shea, J. T., O'Sullivan, R., Smith, A. V. and Wood, L. J.
Smith, J. W. *See* Bower, J. B. C., Jones, H. S., Smith, J. W. and Townsend, C. H.
Spackman, A. J. The Development of Technology by the Gas Industry. (*a*) 298
Spearman, C. A., *See* Pickering, E. W., Spearman, C. A., and Tanner, M. W. G.
Stirk, A. Field Experience of Mechanically Assisted and Fan-diluted Flues. (*a*) 144
Stretch, K. L. The Work and Function of the Research and Development Division. (*a*) 436
Sykes, A. M. Accounting for Conversion. (*a*) 525

Tanner, M. W. G. *See* Pickering, E. W., Spearman, C. A., and Tanner, M. W. G.
Templeman, J. J. *See* Bassett, H. B., and Templeman, J. J.
Tewari, G. P. *See* Sayers, J. F., Tewari, G. P., Wilson, J. R., and Jessen, P. F.
Towler, C. J. *See* Masters, J., Oeppen, B., Towler, C. J., and Wong, P. F. Y.
Townsend, C. H. *See* Bower, J. B. C., Jones, H. S., Smith, J. W., and Townsend, C. H.
Townsend, M. J. Leakage Control. (*a*) 522

Walker, A., and Clerehugh, G. Modern Development of Plastic Systems for Gas Distribution. (*Comm.* 835) . . 102
Presentation, Discussion and Reply 128
Walker, G. O. The First Year's Operation of the Council's Terminal—Bacton. (*a*) 438
Walters, W. J. *See* Clarke, D. J., Cribb, G. S., and Walters, W. J.
Walters, W. J. Developments of the Natural Gas Supply System. (*Comm.* 852) 548
Ward, L. The Application of Work Study to Customer Service (*Comm.* 846) 835
Presentation, Discussion and Reply 845
Whittaker, W. P. *See* Craven, F. and Whittaker, W. P.
Wiles, H. *See* Fotherby, C. B., Mowatt, J. C., Burrows, V. R., Wiles, H., and Harland, T.
Wilson, J. R., *See* Sayers, J. F., Tewari, G. P., Wilson, J. R., and Jessen, P. F.
Wong, P. F. Y. *See* Masters, J., Oeppen, B. Towler, C. J., and Wong, P. F. Y.
Wood, L. J., *See* O'Shea, J. T., O'Sullivan, R., Smith, A. V., and Wood, L. J.
Yalcindag, C. *See* Brameller, A., Chancellor, V. E., Hamam, Y. and Yalcindag, C.

INDEX OF PARTICIPANTS IN DISCUSSIONS

Abbott, K. J. 714
Adam, A. J. 491
Aitken, I. (*a*) . . 70, 300, 441, 442
Alexandre (*a*). 71
Ashton, J. E. (*a*) 143
Ash, M. 428
Ashworth,—(*a*) 438
Auld, J. B. 605

Bairstow, R. (*a*) 437
Barclay, J. D. (*a*) 525
Barlow, J. C. R. (*a*) 232
Bassett, H. B. (*a*) 234
Bates, C. C. 185
Baxendale (*a*). 71, 438
Beavis, D. 358
Becker, K. 692
Bell, F. (*a*) 235
Benjamin, P. 134
Birdsell, J. A. 715
Bollans, H. (*a*) 299
Bolton, G. J. (*a*) 524
Boozey, F. (*a*) 378
Bouch, W. E.. . 286, 383(*a*), 579(*a*)
Bramley, D. (*a*) 232
Brewer, F. J. 473
Brewster, P. J. 833
Bridgins, J. (*a*) 232
Briggs, W. H. (*a*) 142
Browns, R. B. (*a*) . . . 579, 580
Bryce, W. J. G. (*a*) 234
Buckley, H. (*a*) 383
Buckley, J. A. 604, 691
Buckner, R. E. (*a*) 439
Burrell, M. (*a*) 442
Buxton, H. F. 183

Cairns, J. (*a*) 378
Campbell, C. (*a*) 442
Campbell, K. 474
Carmichael, J. S. 44
Chadwick,—(*a*) 578
Cheetham, H. A. 713
Churton, J. 603
Clark, H. J. (*a*) 858
Clark, L. J. (*a*) 580
Clatworthy, E. 689
Clifford, R. E. (*a*) 377
Cloag, B. R. 217
Cockerham, R. G. 429
Collins, W. J. 833
Cooper, F. T. (*a*) 441
Cooper, J. E. 42
Copp, D. L. 285
Cormack, J. D. (*a*) 235
Cornock, J. (*a*) 300
Cottingham, D. (*a*) 379
Craven, D. 133, 254
Crew, R. J. O. (*a*) 380
Crewdson, S. A. (*a*) 71
Culshaw, G. W. 361

Daglish, A. G. 745
Dalton, J. (*a*) 437
Dance, E. W. G. (*a*) . . . 142, 232
Davenport, R. 216
Davies, H. S. 44
Davison, G. R. 254
Dean, R. C. (*a*) 524
Deall,—(*a*) 443
Dell, J. (*a*) 728
Densham, A. B. (*a*) 379
Desty, D. H. 493
Dewhurst, J. R. . . . . 436(*a*), 543
Dick, T. A. 545
Dixon-Lewis, G. 317
Dove, A. 742
Drabble, J. S. (*a*) 233
Duxbury, A. D. 690

Edmondson, H. 493
Elgin, D. C. 98, 300, 441
Ellis, J. (*a*) 728
Esslemont, A. B. (*a*) . . . 299, 300
Evans, B. M. 768
Evans, C. J. (*a*) 383
Evans, E. N. 742
Evans, R. 130, 255, 652
Ewing, L. 135

Fairman, J. R. (*a*) 440
Faulkner, E. L. (*a*) . . . 235, 786
Faulkner, P. (*a*) 143, 578
Fincham, A. E. 218
Fitzsimons, W. A. 472, 714
Fletcher, ... 144
Francis, W. E. 402
Frear, M. E. (*a*) 383

Gaston, A. G. A. M. (*a*) 380
Gay, D. C. (*a*) 440
Gibson, R. (*a*) 379
Gigiel, J. A. (*a*) 380
Gordon,—(*a*) 231
Gowans, J. M. (*a*) 728
Gray, J. (*a*) 70
Gray, J. A. 285
Greiff, P. (*a*) 71
Griffiths, A. 787

Hackett, R. S. (*a*) 233
Haffner, A. E. (*a*) 438
Hall, B. (*a*) 522
Hamlyn, D. W. (*a*) 144, 578
Hancock, R. A. (*a*). 231
Harris, A. R. 217
Harris, R. W. H. (*a*) . . . 436, 858
Hartill, I. J. 769
Hartley, K. R. (*a*) 728
Haynes, R. G. 715
Heywood, S. (*a*) 522
Higgins, A. G. (*a*) 579
Higgs, A. 691
Hill, K. B. 427
Hoggarth, M. L. 317
Holmes, G. (*a*) 522
Holmes, W. H. 403
Hughes, H. W. D. . . . 693, 767, 788
Hunter, A. (*a*) 70
Hunter, R. (*a*) 301

Ireland, E. (*a*) 522
Isherwood, B. 135

Jackman, M. I. 132
Jackson, A. M. (*a*) 441
James, C. G. 218
Jarrett-Kerr, H. A. 287
Jenkin, D. B. (*a*) 858
Jennings, A. C. 693
Jewers, W. G. 41
Johnson, E. (*a*) 858
Johnson, F. J. 712
Johnson, R. E. (*a*) 231
Johnson, R. E. C. (*a*) 525
Johnston, R. E. (*a*) 230
Jones, — (*a*) 578
Jones, D. R. 771
Jones, D. U. 767
Jones, M. W. 41
Joynes, J. H. (*a*) 299

Kendall, C. R. (*a*) 381
Kidd, I. C. (*a*) 441, 442
Kilvert, J. R. (*a*) 233
King, W. E. H. (*a*) 379
Kirkby, E. B.. . . . . 43, 233(*a*)
Kumpf, E. (*a*) 439

Lacy, A. J. 744
Lacy, T. 578
Laidlaw, R. A. 693
Laidlaw, R. D. 473
Lake, F. 361
Lawrence, M. 142
Lawrence, M. E. (*a*) 526
Leith, T. R. 184
Lewis, C. H. (*a*) 380
Lewis, J. T. (*a*) 579
Lillicrap, J. K. 746
Littlejohn, C. R. (*a*) 141
Loveday, C. E. J. 45
Lucas, T. A. 43, 787
Lush, — (*a*) 71

McCrae, S. R. 98
McKay, J. (*a*) 70

McKenzie, E. C. (*a*) . . . 230
McKerrigan, W. (*a*) . . . 70
McLundie, C. (*a*) 301
McNeil, —(*a*) 71
Madge, G. H. W. . 100, 380(*a*), 437(*a*)
Marks, G. C. 131
Mason, A. D. . . . 133, 655
Mason, G. W. (*a*) 523
Matthews, H. (*a*) 728
Mayo, L. W. 359
Meek, B. 743
Mills, C. E. 182, 831
Minchin, L. T. . . 319, 361, 604
Mitchell, F. (*a*) . . . 301, 442
Moorcroft, W. (*a*) 143
Moore, —(*a*) 71
Moys, F. (*a*) 441

Nance, M. F. (*a*) . . 135, 380, 546
Napier, T. (*a*) 70
Napier, T. P. (*a*) 300
Naylor, R. (*a*) 143
Nelson, R. W. 788
Newman, —(*a*) 378
Newman, L. (*a*) 524
Nicholson, W. E. (*a*) . . . 383
Noble, T. G. (*a*) 437
Nutting, J. 427

O'Connor, J. F. 361
Olden, M. J. F. 652
O'Sullivan, R. 185

Page, E. 144
Pankhurst, E. S. 135
Parish, C. (*a*) . . . 438, 443
Patterson, S. K. (*a*) 441
Phillips, A. (*a*) 442
Pickering, E. W. 651

Pickles, A. E. 429
Place, B. (*a*) 438
Plumb, G. A. 45
Porter, W. H. B. 286
Pratt, A. G. 253, 832
Prigg, J. A. (*a*) 377
Pritchard, A. B. (*a*) . . . 231
Pritchard, R. 318
Proffitt, R. 715
Prosser, —(*a*) 728
Purkis, C. H. (*a*) 380

Ransom, J. C. C. 97
Raybould, R. H. (*a*) . 235 (*a*), 256, 769
Reader, R. D. (*a*) 437
Reboul, J. 545
Redman, M. 544
Reed, S. B. 314
Rhodes, R. P. 603
Rigg, J. (*a*) 378
Rigg, J. V. (*a*) 437
Riley, R. V. 134
Roberts, G. F. I. (*a*) . . . 440
Roberts, S. S. (*a*) 441
Robertshaw, G. W. (*a*) . . . 521
Robson, J. S. (*a*) 439
Romaine. R. 474
Rooke, D. E. 284
Ross, N. C. 132
Ruddick, A. (*a*) 580

Sanderson, C. (*a*) 579
Sawyer, F. W. (*a*) 580
Schneider, H. J. 46
Scott, G. B. 128
Shann, C. D. (*a*) 525
Sharpe, G. C. H. (*a*) . . . 231
Sheard, R. R. 428
Shearer, A. B. 743
Shearer, J. (*a*) 300
Shearer, J. L. 653
Shepherd, P. A. 654
Shewan, K. J. 788
Simpson, J. M. (*a*) 70
Simpson, P. B. (*a*) 729
Sinha, —(*a*) 300
Smettem, C. (*a*) 858
Smith, B. C. 492, 831
Smith, M. J. (*a*) 439
Smith, R. A. 318
Smith, T. R. 135
Spackman, A. J. (*a*) . . 378, 858
Spelman, A. W. 254
Starr, F. 186
Steel, J. E. . . . . 437(*a*), 653
Steele, R. (*a*) 70
Steinkamp, J. H. 771
Stocks, R. E. 287
Strang, W. G. (*a*) . . . 441, 442
Swallow, B. (*a*) 443
Swijsen, A. A. G. 494

Tait, S. A. (*a*) 235
Tansley, A. V. 131
Taylor, F. M. H. 403
Taylor, J. C. B. 744
Thomas, B. E. (*a*) 233
Thompson, B. H. 257
Thompson, R. J. S. 46
Thorpe, J. 360
Tilley, J. G. 360
Townsend, C. H. 129
Tunnah, K. 766

Urwin, N. J. 99

van der Post, J. L. 215
van Stavren, D. A. (*a*) . . . 231

Walker, A. 651
Walker, J. H. 257
Walters, W. J. 40
Ward, J. A. (*a*) . . . 524, 525
Ward, T. G. 833
Ware, P. G. 493
Watkins, D. M. (*a*). 440
Watson, E. (*a*) 378
Waywell, V. (*a*) 578
Webster, A. G. (*a*) 378
Wedepohl, L. M. 216
Welding, J. B. (*a*) 381
Welford, P. (*a*) 378
White, T. T. 603
Whitehurst, J. D. (*a*) . . . 144
Widginton, D. W. 359
Wilkinson, D. G. (*a*) . . . 144
Wilkinson, J. B. (*a*) . . . 728
Winder, J. (*a*) 729
Wingate, J. R. 286
Wingfield, T. 744
Winn, R. (*a*) 70
Wonham, A. J. 134
Wood, L. J. 136
Woodall, C. T. C. (*a*) . . . 858
Woodman, J. V. (*a*) 858
Wright, A. E. (*a*) 232
Wright, C. L. 473
Wrobel, J. 46

Yates, A. 768
Young, D. A. (*a*) 439

COMMUNICATIONS OF THE INSTITUTION

(Where applicable, discussions and Authors' replies thereto follow immediately after the Communications.)

No. 832 31st Report of the Chairmen's Technical Committee: 1969-70 3

No. 833 First Report of the Education and Training Commettee: 1969-70 83

No. 834 "Large-volume Gas Measurement", by A. Griffiths and J. Newcombe 23

No. 835 "Modern Development of Plastics Systems for Gas Distribution", by A. Walker and G. Clerehugh . 102

No. 836 "Engineering Problems on High-pressure Gas Plants", by G. M. Rimmer 163

No. 837 "Recent Advances in Mathematical Analysis for Gas Industry Application", by A. Brameller, V. E. Chancellor, Y. Hamam, and C. Yalcindag . 188

No. 838 "The Blow-off of Burner Flames", by H. Edmondson and M. P. Heap 305

No. 839 "New Developments in Radiant Heating Systems", by K. F. Coles and L. P. Bagge 387

No. 842 "Presidential Address", by F. Bell, O.B.E. . . . 450

No. 843 "Computers, Communications and Customers", by K. E. Jones and W. V. Olsson 807

No. 844 "Total Energy in the Gas Industry", by J. Pearson and P. B. Simpson 733

No. 845 "The Philosophy of Gas Storage", by D. J. Clarke, G. S. Cribb and W. J. Walters 748

No. 846 "The Application of Work Study to Customer Service", by L. Ward 835

No. 847 "Natural Gas in Large-volume and Industrial Markets (As Experienced by an Ontario Utility)", by E. G. Moogk 671

No. 848 "New Developments in Distribution in the United States", by M. W. Anuskiewicz 637

No. 849 "The Development and Exploitation of Rapid Heating Techniques", by J. Masters, B. Oeppen, C. J. Towler and P. F. Y. Wong 695

No. 850 "Control System for the Gas Council's Transmission Network", by J. B. C. Bower, H. S. Jones, J. W. Smith and C. H. Townsend 773

No. 852 "Development of the Natural-gas Supply System", by W. J. Walters. (*Comm.* 852) 548

No. 853 "Some Aspects of the Maintenance of a High-pressure Gas Transmission System", by R. N. Knott 606

RESEARCH COMMUNICATIONS OF THE GAS COUNCIL

(Where applicable, discussions and Authors' replies thereto follow immediately after the Research Communications.)

No. *GC*169 Report on the Gas Council Research Scholarships: 1970 49

No. *GC*170 "Multi-stage Jet Boosters", by H. B. Bassett and J. J. Templeman 239

No. *GC*171 "Spark Ignition of Natural Gas—Theory and Practice", by J. F. Sayers, G. P. Tewari, J. R. Wilson and P. F. Jessen 322

No. *GC*172 "Flash Tube Ignition of the Cooker Hotplate", by A. J. Miles 339

No. *GC*173 "The Effects on Plastic Pipes of Gas-conditioning Agents and Other Additives", by J. T. O'Shea, R. O'Sullivan, A. V. Smith and L. J. Wood 117

No. *GC*174 61st Report of the Joint Refractories Committee: 1969-70 405

No. *GC*175 "Leakage Control in the Natural Gas Era", by E. W. Pickering, C. A. Spearman, and M. W. G. Tanner 260

No. *GC*176 "The Technology of Large Boiler Firing Using Interruptible Supplies of Gas", by R. A. Hancock 462

No. *GC*177 "Installation and Ventilation", by E. W. Berry, R. D. Bruce, and B. C. Carter 589

No. *GC*178 "The Odorisation of Natural Gas", by A. B. Densham, P. A. Gibbons, M. D. Glidewell, R. Palmer, and G. F. I. Roberts 529

No. *GC*179 "Non-aerated Burners for Natural Gas", by B. C. Dutton, J. A. Harris and B. Kavarana . 476